

REMARKS

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 6-14 were pending. By the present response, claims 9 and 14 have been amended, and claims 15-24 have been added. Thus, upon entry of the present response, claims 6-24 remain pending and await further consideration on the merits.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: page 3, lines 18-27; page 7, lines 20-22; and the original claims.

OBJECTION TO THE SPECIFICATION

The specification stands objected to on the grounds set forth on page 2 of the Official Action. By the present response, applicants have amended the specification in a manner which is believed to address the above-noted objections. Thus, reconsideration and withdrawal of the objections is respectfully requested.

CLAIM OBJECTIONS

Claims 9 and 14 are objected to because of informalities. Claims 9 and 14 have been amended, without narrowing the scope thereof, to address the objection. Thus, reconsideration and withdrawal of the objection is respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §102

Claims 6-7 and 11-13 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,743,556 to Breton et al. (hereafter "*Breton et al.*") on the grounds set forth on page 3 of the Official Action. This rejection is respectfully traversed.

The present invention is directed to an arrangement, such as a seal system. Conventional arrangements which comprise a coating of chromium carbide disposed in a cobalt matrix are deficient in that they form too much cobalt oxide on the surface thereof, and thus fail to provide the desired service lifetime when operated in an environment including high temperatures (see, e.g., page 1, lines 25-30).

According to the present invention, an arrangement is provided which includes a coating having a composition and configuration such that the excess formation of cobalt oxide is avoided. A seal system constructed according to the principles of the present invention is set forth in claim 6. Claim 6 recites:

6. A seal system between two articles wherein at least one article is coated with a wear protective coating, the coating comprises at least a first layer on the surface of the article, the first layer comprising a certain amount of chromium carbides dispersed in a cobalt matrix and at least a second layer of the coating on top of the first layer, the second layer comprising an amount of chromium carbides dispersed in a cobalt matrix which is higher than the amount of chromium carbides in the first layer.

Contrary to the assertions contained on pages 4-5 of the Official Action, *Breton et al.* fails to anticipate the system set forth in claim 6 above. *Breton et al.* is

directed to a technique for coating a substrate with a powdered filler and molten metal.

The technique described by *Breton et al.* for forming a coating on a substrate, the coating comprising a metal matrix containing a filler material disposed therein, involves the intermediate step of tacking a two-layer strip onto the substrate with an adhesive, then heating the layers to infuse the filler material with metal alloy, while volatilizing an organic binder material which holds the metal materials together, thereby resulting in a single-layer coating which is metallurgically bonded to the substrate. *Breton et al.* discloses that the metal binder can comprise a "cobalt based alloy" (column 2, line 51).

First, as evident from claim 6 reproduced above, the coating of the present invention requires first and second layers which include a cobalt matrix. By contrast, *Breton et al.* fails to disclose a coating of any kind whatsoever formed of a cobalt matrix. Instead, *Breton et al.* teaches that the matrix of the coating can comprise a cobalt alloy. Thus, *Breton et al.* fails to anticipate claim 6 for at least this reason alone.

Second, it is asserted, for example, on page 3 of the Official Action, that the two-layer intermediate step taught by *Breton et al.* "can be used as a seal system," thereby satisfying the requirements of claim 6. This assertion is respectfully traversed. Contrary to the assertions contained in the Official Action, *Breton et al.* teaches a one-layer coating. The coating, as permanently attached to the substrate is clearly in the form of a single layer: "heating the assembly of Fig. 8 decomposes the binder and yields the coated substrate shown in Fig. 4" (column 4, lines 20-22).

As taught by *Breton et al.*, the temporary two-layer intermediate product is temporarily attached to the substrate by an adhesive (see, e.g., lines 24-27). As such, this temporary two-layer intermediate is clearly unsuited for use as a seal system, contrary to what is alleged in the Official Action. Thus, for at least these additional reasons, *Breton et al.* fails to anticipate unamended claim 6.

Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 7 and 11-13 depend either directly or indirectly upon claim 6. Thus, these claims are also distinguishable over *Breton et al.* for at least the same reasons noted above.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claim 10 stands rejected under 35 U.S.C. §103(a) as being obvious over *Breton et al.* on the grounds set forth on page 4 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

It is asserted on page 3 of the Official Action, that "Breton discloses all of the limitations of claim 6" This assertion is respectfully traversed for the same reasons noted above. It is further asserted in the grounds for rejection that:

Because Breton does not specifically disclose a thickness, it would have been obvious to a person having ordinary skill in the art at the time of the invention to make each layer the same thickness.

This assertion is respectfully traversed.

The above assertion that since *Breton et al.* fails to disclose any thickness, then all thicknesses, including an equal thickness of the layers of the coating, would have been obvious is clearly illogical. Moreover, the grounds for rejection fails to

establish a *prima facie* case of obviousness by failing to include any reasons whatsoever as to why one of ordinary skill in the art would have been motivated to have provided each layer with the same thickness. Reconsideration and withdrawal of the rejection is respectfully requested.

Claim 8 stands rejected under 35 U.S.C. §103(a) as being obvious over *Breton et al.* on the grounds set forth on page 4 of the Official Action, in view of U.S. Patent No. 4,822,248 to *Wertz et al.* For at least the reasons noted below, this rejection should be withdrawn.

This assertion is respectfully traversed for the reasons previously noted. The teachings of *Wertz et al.* are applied as allegedly disclosing wear resistant surfaces on a turbine blade seal as well as abutment faces including notched edges. However, even if the teachings of *Wertz et al.* were applied in the manner suggested, the claimed invention would not result. Namely, *Wertz et al.* fails to cure the deficiencies previously noted above in connection with the teachings of *Breton et al.* Thus, reconsideration and withdrawal of the rejection is respectfully requested.

Claims 9 and 14 stand rejected under 35 U.S.C. §103(a) as being obvious over *Breton et al.* as applied to claim 6 in view of U.S. Patent No. 4,884,820 to Jackson et al. (hereafter "*Jackson et al.*") on the grounds set forth on page 5 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

Again, it is asserted on page 5 of the Official Action that "Breton discloses all the limitations of claim 6." As explained above, *Breton et al.* fails to disclose a seal system including those limitations recited in claim 6 above. The teachings of

Jackson et al. are applied as allegedly teaching the recited coating thicknesses. However, even if the teachings of *Jackson et al.* were applied in the manner suggested, the claimed invention would not result. Namely, *Jackson et al.* fails to cure the deficiencies previously noted above in connection with the teachings of *Breton et al.* Thus, reconsideration and withdrawal of the rejection is respectfully requested.

NEW CLAIMS 15-24

Newly presented claim 15 is directed to an arrangement constructed according to the principles of the present invention. Newly presented claim 15 recites:

15. (New) *An arrangement comprising:
a first component having a first surface,
second component having a second surface; and
a coating disposed on at least one of the first and
second surfaces, the coating comprising:
a first layer, the first layer comprising a first
amount of chromium carbides dispersed in a cobalt matrix,
and
a second layer, the second layer disposed
adjacent to the first layer, the second layer comprising a
second amount of chromium carbides dispersed in a cobalt
matrix,
wherein the first amount of chromium carbides
is greater than the second amount of chromium carbides.*

It is believed that claim 15 is distinguishable over *Breton et al.* for at least the same reasons that claim 6 is distinguishable over *Breton et al.* Claims 16-24 depend either directly or indirectly upon claim 15. Thus, it is believed that these claims are also distinguishable over the applied prior art for at least the same reasons noted herein.

CONCLUSION

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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